Paper No. 33

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LYNN FORESTER,
NEIL H. HENDRICKS
and DONG-KYU CHOI

Appeal No. 2001-0777
Application No. 08/652,893

ON BRIEF

Before OWENS, KRATZ and MOORE, Administrative Patent Judges.
KRATZ, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the examiner's refusal to allow claims 14-17, 19-26 and 46-49. No other claims remain pending in the application.

BACKGROUND

Appellants' invention relates to a method for annealing substrates coated via chemical vapor deposition with wide

electron beam radiation, a product film and a product microelectronic device. An understanding of the invention can be derived from a reading of exemplary claim 14, which is reproduced below.

> 14. A process for annealing a substrate coated with a chemical vapor deposit material comprising:
> a) applying to the surface of the substrate the chemical vapor deposit material; and
> b) exposing the chemical vapor deposit material to a wide, large beam of electron beam radiation from a substantially uniform large-area electron beam source, to expose the whole coated substrate simultaneously, under conditions sufficient to anneal the chemical vapor deposit material into a film.

The prior art references of record listed by the examiner at page 3 of the answer are:

Umemura	4,713,258	Dec. 15, 1987
Yamaguchi et al. (Yamaguchi)	4,983,540	Jan. 08, 1991
Livesay	5,003,178	Mar. 26, 1991

Japanese patent abstract of 58-151517, by Yoshii, 7-1985.

The examiner additionally relies on the following prior art reference:

Yoshii[1] (published Japanese Patent Application)	60-043814	Mar. 08, 1985

[1] All references to Yoshii in this decision are to the English language translation of the published Japanese patent application that is of record. See paper No. 28.

Claims 14-17, 19-21, 23-26 and 46-49 stand rejected under 35 U.S.C. § 103 as being unpatentable over Japanese patent abstract 58-151517 and Yoshii taken collectively in view of Yamaguchi and Livesay (answer, pages 4-7 and supplemental answer).[2] In rejecting claim 22 under 35 U.S.C. § 103, the examiner additionally relies on Umemura (answer, page 7).

We refer to the brief and reply brief and to the answer for a complete exposition of the opposing viewpoints expressed by appellants and the examiner concerning the issues before us on this appeal.

OPINION

Upon careful review of the entire record including the respective positions advanced by appellants and the examiner with respect to the rejections that remain before us for review, we find ourselves in agreement with appellants in so far as the examiner has failed to carry the burden of establishing a prima facie case of obviousness. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Piasecki, 745

[2] The examiner has corrected the record (Paper No. 30) to clarify that both the Japanese patent abstract of 58-151517 and Yoshii (published Japanese patent application) were being applied as evidence of obviousness by the examiner. Appellants have acknowledged their awareness of the evidence being relied upon by the examiner. See Paper No. 31.

F.2d 1468, 1471-1472, 223 USPQ 785, 787-788 (Fed. Cir. 1984). Accordingly, we will not sustain the examiner's rejections.

Here, all of the appealed method claims require the process steps of chemically vapor depositing a material on a substrate and, under annealing conditions, exposing the whole CVD coated substrate simultaneously to a wide, large beam of electron beam radiation to form a film from the CVD material.

As acknowledged by the examiner, the Japanese patent abstract of 58-151517 and Yoshii taken collectively do not disclose either the chemical vapor deposition step or the particular electron beam radiation application step as claimed by appellants. Rather, those references disclose depositing a silicon dioxide material without specifying a CVD method followed by annealing with a scanning electron beam. According to Yoshii (page 4 of the translation), the electron beam is scanned with a 10 micron step width. Yoshii (page 3 of the translation) was concerned with solving problems with poor element characteristics and non-uniformity obtained when applying a scanning electron beam. Yoshii (first full paragraph at page 4 of the translation) solved that problem by employing islands covered with thick insulating film that results in less energy being applied to the

islands during the application of the scanning electron beam.

Yamaguchi (column 11, lines 8-21) discloses the use of CVD material and ion bombardment for filling grooves formed in superlattices and Yamaguchi (column 12, lines 20-33) further suggests that a scanning electron beam can be used for annealing. Livesay is directed to the use of a wide and large electron beam for purposes of shadow mask lithography, resist sensitivity measurement, lift off processing, resist curing and other lithography, testing and inspection applications. See, e.g., the abstract and column 8, lines 1-5 of Livesay. According to the examiner, it would have been obvious to one of ordinary skill in the art to employ the CVD technique of Yamaguchi and the large electron beam of Livesay in the methods of Japanese patent abstract of 58-151517 and Yoshii so as to arrive at the claimed subject matter.

However, in order for a prima facie case of obviousness of the claimed invention to be established, the prior art as applied must be such that it would have provided one of ordinary skill in the art with both a suggestion to carry out appellants' claimed invention and a reasonable expectation of success in doing so. See In re Dow Chemical Co., 837 F.2d 469, 473, 5 USPQ2d 1529,

1531 (Fed. Cir. 1988). "Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure." *Id.*

Thus, a prima facie case of obviousness is established by showing that some objective teaching or suggestion in the applied prior art taken as a whole and/or knowledge generally available to one of ordinary skill in the art would have led that person to the claimed invention, including each and every limitation of the claims, without recourse to the teachings in appellants' disclosure. See generally In re Oetiker, 977 F.2d 1443, 1447-48, 24 USPQ2d 1443, 1446-47 (Fed. Cir. 1992) (Nies, J., concurring). This showing can be established on similarity of product or of process between the claimed invention and the prior art. Here, the examiner has presented insufficient evidence or scientific reasons so as to establish that one of ordinary skill in this art would have been led to employ the large electron beam source of Livesay in performing the annealing step(s) of Japanese patent abstract of 58-151517 and Yoshii so as to solve the problems desired to be addressed by Yoshii in the annealing step based on any of the applied teachings of Livesay concerning the application of a wide electron beam in other processes, as

discussed therein. Nor has the examiner explained how the product of the Japanese patent abstract of 58-151517 and Yoshii alone or in combination with the other applied references would have rendered the products of appealed claims 24-26 prima facie obvious. As for claim 22, the examiner has not established how the teachings of Umemura would have cured the deficiencies of the other applied references.

The examiner's opinion that greater throughput possibilities would have led one of ordinary skill in the art to employ the large electron beam apparatus of Livesay in the annealing method steps of the Japanese patent abstract of 58-151517 and Yoshii is not sufficient without any particularized consideration of the effect of the use of such an apparatus on the special problems that Yoshii was addressing. In this regard, the examiner has not established that one of ordinary skill in the art would have expected such a proposed modification of Yoshii and the Japanese patent abstract of 58-151517 to be attended by a reasonable expectation of success. Consequently, on this record, we are constrained to reverse the stated rejections.

OTHER ISSUES

Prior to final disposition of this application, the examiner should determine whether or not any prior art of record, including prior art discussed at pages 1-3 of appellants' specification would have rendered any of the product-by process claims 24-26 unpatentable. See In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) ("If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process.").

CONCLUSION

The decision of the examiner to reject claims 14-17, 19-26 and 46-49 under 35 U.S.C. § 103 is reversed.

REVERSED

TERRY J. OWENS Administrative Patent Judge	)	
PETER F. KRATZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JAMES T. MOORE Administrative Patent Judge	)	

PFK/sld

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APPEAL NO. - JUDGE KRATZ
APPLICATION NO.

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DECISION: **ED**

Prepared By:

DRAFT TYPED: 31 Dec 03

FINAL TYPED: